Intensive hepatitis B vaccination in hemodialysis patients. A single centre experience.

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Introduction

In hemodialysis patients, seroconversion rate after vaccination against hepatitis B virus (HBV) is relatively low and varies between 50 and 90%[1,2]. Better immunological response has been observed in more intensive vaccination of higher doses, as well as in intradermal administration, repeated or early vaccination.[1,2,3,4].

Aim

To study the efficacy of intensive HBV vaccination in hemodialysis patients of our unit. Secondly, to estimate the impact of several demographic, dialysis and biochemical parameters in immunological response.

Materials and methods

Twenty-six (26) hemodialysis patients were studied (15 male), with mean age 69.6 years (47-83), and baseline antibody titer against surface antigen of HBV (anti-Hbs) less than 10mIU/ml. Five doses (months 0, 1, 2, 3 and 6) of hepatitis B vaccine (Engerix B®) of 40 mcg were infused intramuscularly on each patient. One month after the last vaccination dose, immunological response was measured. Depending on anti-Hbs titer, patients were divided in three groups: A: with anti-Hbs<10 mIU/ml., B: with anti-Hbs between 10 and 100 mIU/ml., C: with anti-Hbs>100 mIU/ml (goal titer). Group B and C patients were defined as responders. Two weeks later, group A patients received two additional vaccination doses, in ten days interval. Group B patients (responders with low titer) received one additional dose. In these two groups anti-Hbs titer was measured again. Demographic and laboratory data, dialysis method, residual urea clearance and Urea Reduction Ratio were recorded. All above were analyzed for probable association with anti-Hbs titer. Quantitative variables were expressed as mean value±standard deviation (or median and range for variables with ubnormal distribution). For correlation between qualitative variables and anti-Hbs titer, t-test was used. The Spearman correlation coefficient (r) was used in the correlation analysis between quantitative variables and anti-Hbs titer. P-values<0.05 were considered statistically significant.

Results

All patients completed initial vaccination scheme. One (1) patient of group B died before the completion of additional doses. Therefore, in estimation and comparison between initial and final response rates, this patient was excluded (table 1). Responders' rate was 60% (n=15), and after the additional doses it was increased in 64% (n=16). Initial and final rates of achieving goal titer were 40% (n=10), and 56% (n=14) respectively (Table 1).

Table 1: Vaccination schedule and efficacy

	Schedule	Patients vaccinated	Responders	Achieving goal titer
Initial protocol	months 0, 1, 2, 3, 6	25	15 (60%)	10 (40%)
Revaccination protocol 1	one additional dose	5[a]		4 (80%)
Revaccination protocol 2	two additional doses (ten days interval)	10[b]	1 (10%)	0 (0%)
			16 (64%)	14 (56%)

a: antiHbs >10 miu/ml και < 100miu/ml, b: antiHbs< 10 miu/ml.

Younger patients had significantly higher anti-Hbs titer (p=0.008) (Table 2-Fig.1). Shorter time on dialysis and better adequecy didn't lead to higher seroconversion. Moreover, inflammation and nutritional status (as expressed by CRP and albumin levels respectively) didn't seem to affect the magnitude of response (Table 2). Residual urea clearance above 2ml/min was associated to a trend towards higher anti-Hbs titer (p=0.055), while gender, membrane permeability and presence of Diabetes Meliteus showed no impact in responsiveness (Table 3).

Table 2: Quantitative variables correlated with antibody titer in two variables' correlation analysis.

	r	p
Age	-0.508	0.008
Time in dialysis	-0.059	0.776
Urea Reduction Ratio	-0.303	0.132
CRP	-0.132	0.520
Serum albumin	-0.014	0.946
PTH	-0.241	0.236

Table 3: Qualitative variables correlated with antibody titer in two variables' correlation analysis.

Variable	Antibody titer		t	p
Gender (male/female)	463±119.6	331±99.8	-1.231	0.230
Clu>2ml/min (yes/no)	473±131.2	161±81.7	-2.017	0.055
Diabetes Meliteus (yes/no)	459±108.4	258±91.2	-1.329	0.196
Filter membrane permeability (low/high)	351±109.5	278±127.3	-0.436	0.667

Antibody titer is expressed as mean value±standard error. Clu: urea renal clearance in 24h urine sample

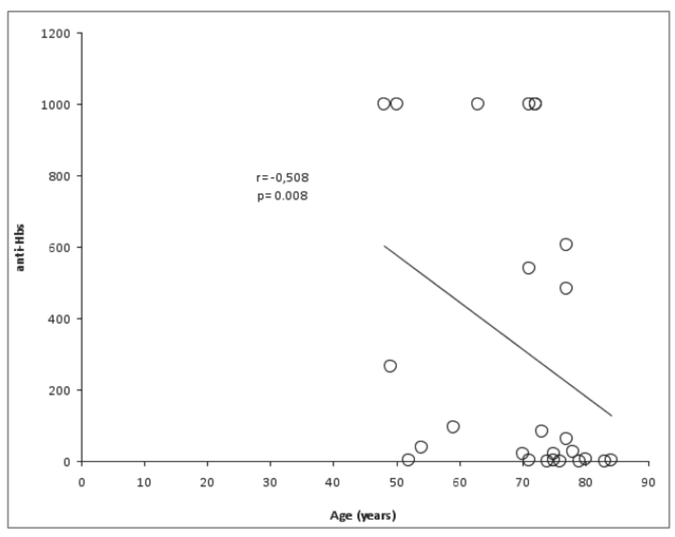

Fig. 1: Correlation between anti-Hbs titer and patients' age, after vaccination against HBV.

Conclusions

Intensive HBV vaccination in hemodialysis patients of our unit resulted in satisfying rates of immunological response. Additional vaccination improved anti-Hbs titer in responders with low titer.

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